

Fig. 2, *T. dioscoricola* (C. B. Ad.)  $\times 16.6$ , alt. 1.38, diam. 1.27 mm.

Fig. 3, *T. caeca* (Guppy)  $\times 16.6$ , alt. 1.67, diam. 1.73 mm.

Fig. 4, *C. e. floridanum* Clapp  $\times 21$ , alt. 1.73, diam. 0.78 mm.

Fig. 5, *C. e. floridanum* Clapp  $\times 21$ , alt. 1.64, diam. 0.72 mm.

Fig. 6, *C. e. floridanum* Clapp  $\times 20$ , alt. 1.73, diam. 0.66 mm.

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THE ANATOMY OF TWO AFRICAN NAYADES, *UNIO CAFFER* AND  
*SPATHA WAHLBERGI*.

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BY A. E. ORTMANN.

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*UNIO CAFFER* Krauss, Sued Afr. Moll. 1848.

*Nodularia caffer* Simpson, Synopsis, 1900, p. 825.

*Unio caffer* Simpson, Descript. Catal. 1914, p. 574.

When Simpson placed this species in *Nodularia*, the anatomy of only two species of this genus was known, and these had the inner gills marsupial. We know now, that Simpson's *Nodularia* is altogether a conglomerate of entirely heterogeneous forms. The present species was placed by Simpson (in 1914) in *Unio*, since he had seen gravid specimens. But he does not give any particulars as to the structure of the soft parts, and thus it is desirable to give an account of them.

I am indebted to B. Walker for the soft parts of a number of specimens of this species, collected at two localities; Lindague Spruit, Natal (trib. to Little Tugela River, coll. in July 1913); and Premier Mine Pumping Station, junction of Elands and Wilge River, near Pretoria, Transvaal (coll. April 1914).

The gravid females collected in July had mostly eggs, but one of them had glochidia; of those collected in April only one female was gravid, and also had glochidia. It is hardly possible to draw from these dates a conclusion as to the breeding season, except that it might begin in July, provided that there is at all a definite season.

*Anatomy:* Anal opening separated from the supraanal opening by a moderate mantle connection, slightly shorter than the anal. Supraanal about as long as or slightly longer than the anal. The latter with the inner edge almost smooth. Branchial

opening with distinct papillae. No differentiating structures on mantle-edge in front of branchial. *Palpi* subfalciform, of medium size, their posterior margins united for nearly half their length.

*Gills* of the Unionid-type: gill diaphragm complete, separating anal and branchial openings. Anterior end of inner gills widely remote from the palpi. Inner lamina of inner gill free from abdominal sac, except at anterior end.

*Septa* and *water-tubes* present, the former continuous and not interrupted, parallel to the gill-filaments. In the male, and in the inner gill of the female, they are weak and distant from each other. *The outer gill of the female is marsupial* practically in its entire length, with heavy and crowded septa.

When charged, the marsupium is moderately swollen, the edge remaining sharp. *Placentae* lanceolate and compressed, moderately developed, when eggs are present, less so, when glochidia are present.

*Glochidia* subtriangular in shape, longer than high, lower margin bluntly pointed in the middle; hooks have not been observed, but there is a slight swelling of the margin at the point, without any spinules. It might be that both of my specimens contain only immature glochidia, and that the mature glochidia have hooks of the *Unio*-type: but the glochidia do not look like immature ones. Size of glochidium: L. 0.23 to 0.25; H. 0.20 to 0.21 mm. (in *Unio pictorum*, L. and H. is 0.21 mm.).

The structure is that of the subfamily *Unioninae*, and especially of those genera which have only the outer gills marsupial. Considering the general shape of the shell, zig-zag beak sculpture, anatomy and glochidia (triangular shape of the latter and their size), this species stands very near to the genus *Unio* in the modern sense (Ortman, Ann. Carm. Mus. 8, 1912, p. 273); the only difference is, that the glochidia, although possessing the characteristic triangular shape, have no hooks but this might be due to immature condition.

For the present, it is advisable to retain this species in the genus *Unio* (*U. pictorum* as type), and there is no doubt that it stands at least *very close to it*. If a separate generic (or subgen-

eric) name should be found to be necessary, *Cafferia* Simpson should be considered.

SPATHA (SPATHA) WAHLBERGI (Krauss).

Simpson, Descr. Cat. 1914, p. 1326.

From Mr. W. Israël I have received two specimens from Mkata River (tributary to Wami R.), and two specimens from Ngerengere River (tributary to Kingani or Ruwu R.) both near Mrogoro, German East Africa (collected by Mr. Rudolf). They all resemble each other, but the specimens from the Mkata have a brownish epidermis, those from the Ngerengere a blackish brown one. They agree well with the description and figure of *S. natalensis* Lea (Obs. xi. 1887, pl. 20, f. 58), which is a synonym of *wahlbergi* Krauss.

The specimens from the Mkata are both females, those from the Ngerengere are male and female.

In NAUTILUS 24, 1910 pp. 39-42, I have described the soft parts of *Spatha kamerunensis* Walker, a West African form, which belongs to the subgenus *Aspatharia* Bourguignat. The present species is a real *Spatha*, and the examination has shown, that it closely resembles *kamerunensis* in its anatomy, with the exception of one detail.

*Anal opening* ovate, about as long as the branchial, closed above by the union of the inner edges of the mantle, *without a supraanal opening*. Edge of anal thickened and wrinkled, but without papillae, probably capable of a moderate tubular extension (siphon). Anal separated from the branchial opening by a *solid connection of the mantle edges*. *Branchial defined below (or anteriorly) by connection of the inner mantle edges*, which, however, is short, shorter than the branchial (about one fourth to one third as long). In one of my specimens, this connection is torn apart, but still distinctly recognizable. Edge of branchial somewhat elevated and with small or indistinct papillae, probably also forming a short siphon. Farther in front, the mantle edges are unconnected and smooth.

*Palpi and gills* exactly of the structure described in *Spatha kamerunensis*. Also here the inner lamina of the inner gills is free from the abdominal sac, and the septa of the gills are of

the same general character. In the female, the septa of the of the inner gill possess, close to the outer lamina, a marked swelling, by which the female may be recognized at once (the swellings are distinctly seen with a hand-lens).

Thus *Spatha wahlbergi* differs from *S. kamerunensis* only by the presence of a mantle connection below (or in front of) the branchial opening, by which this opening becomes perfectly closed and subtubular. Whether this is a general character, which distinguishes the subgenera *Spatha* and *Aspatharia*, remains to be seen. There is no doubt, however, that this character indicates a higher specialisation of *S. wahlbergi*, as compared with *S. kamerunensis*. Attention should be called to the fact, that in the South American shells of the Hyriine-type, this mantle connection anterior to the branchial is rather variable, and may or may not form a generic character (NAUTILUS, 24, 1911, pp. 117, 118).

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#### A NEW CUBAN ZACHRYSLIA.

BY H. A. PILSBRY.

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ZACHRYSLIA RAMSDENI n. sp. Pl. 7, figs. 5, 6.

The shell is depressed-globose, imperforate, of an olive-ocher color, glossy. First  $1\frac{2}{3}$  whorls smooth, following neanic whorls irregularly wrinkled, the last whorl sharply striate above, the base nearly smooth. The periphery is rounded, last whorl descending in front. The aperture is very oblique; outer lip slightly thickened, unexpanded. The base-columellar margin is slightly concave, narrowly reflected and depressed, having a very small nodule nearer to the columella than to the base.

Alt. 13.5, diam. 17.5 mm.; 4 whorls (type).

Alt. 12.5, diam. 15.8 mm.

Manati, Los Canos estate, near Guantanamo, Cuba. Type No. 117482 A. N. S. P., collected by Charles T. Ramsden.

This species resembles *Z. emarginata* Pfr., but differs by the much thinner peristome and especially the narrower base-columellar lip. This forms a wide, flat plate in *emarginata*, but is much narrower in *ramsdeni* than in any other species of the